

Supplement 1. Species ecophysiological parameters and values used in the FireBGCv2 simulation. For the full list of parameters see [10].

Variable Name	Units	Ponderosa pine	Grand fir	Douglas-fir	Lodgepole pine	Western larch	Subalpine fir	Englemann spruce	Whitebark pine	Alpine larch	Western white pine	Western red cedar	Western hemlock	Quaking aspen	Paper birch
Ecophysiological parameters															
Rain interception coefficient	m/LAI/day	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.055	0.045
Light extinction coefficient	DIM	0.35	0.45	0.45	0.4	0.312	0.45	0.45	0.4	0.312	0.4	0.5	0.5	0.5	0.5
All-sided-to-projected conversion factor	m ² /m ²	3.54	2.04	2.85	3.54	2.24	2.04	2.94	3.54	3.54	3.54	2.80	2.80	2.00	2.00
Specific leaf area (SLA)	m ² /kg C	2.4	8	8.7	7.6	18	10	10	7.6	16	10	20	20	25	25
Ratio of shade to sunlit SLA	DIM	1	2	2	1	1	2	1.5	1	1	1	2.5	3	1	1
Maximum canopy conductance	m/sec	0.009	0.006	0.007	0.006	0.009	0.006	0.006	0.007	0.007	0.008	0.006	0.006	0.003	0.003
Leaf water potential at field capacity	–Mpa	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5	–0.5
Leaf water potential at stomatal closure	–Mpa	–2.00	–1.32	–1.90	–1.46	–1.50	–1.20	–1.30	–1.65	–1.00	–1.50	–1.30	–1.30	–2.30	–1.00
Minimum VPD to affect conductance	Pa	930	500	700	600	800	1000	1000	800	1000	800	1000	1000	1000	1000
Maximum VPD to affect conductance	Pa	4100	2000	4500	3000	3500	3000	3000	3000	3000	3000	3000	3000	4200	4200
Light compensation point	W/m ²	560	300	400	550	550	350	370	540	600	450	300	250	550	550
Gap model parameters															
Lifeform ¹	DIM	0	0	0	0	1	0	0	0	1	0	0	0	1	1
Shade tolerance ²	DIM	1	4	3	2	1	4	3	3	1	2	4	5	1	1
Sprouting ability ³	DIM	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Maximum attainable age	years	650	275	600	250	600	250	600	1000	800	400	1000	650	120	120
Maximum attainable height	m	60	54	54	45	65	35	50	25	20	60	40	54	20	30
Maximum attainable diameter	cm	200	100	180	80	200	75	120	138	65	240	200	180	50	75
Minimum number of growing degree days	degree days	1350	1200	988	988	991.9	427.7	527.4	426.7	426.7	1000	1350	1350	600	1000
Optimum number of growing degree days	degree days	1950	1650	1750	1450	1650	1200	1300	1400	1000	1650	1850	1750	1371	1650
Maximum number of growing degree days	degree days	4767.4	3979	3979	3200	4079	3026.7	3026.7	3520	2871	4093	4000	4000	3000	3979
Minimum threshold on water stress curve	DIM	0.15	0.42	0.22	0.28	0.28	0.55	0.59	0.2	0.65	0.4	0.5	0.5	0.15	0.6
50-year site index	m	34	20	13	20	35	18	21	19	8	36	34	34	16	16
Probability of good cone crop	DIM	0.395	0.333	0.446	0.318	0.438	0.333	0.167	0.4	0.368	0.28	0.25	0.33	0.037	0.037
Proportion of seeds in serotinous cones	DIM	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0
Cone crop block years	DIM	2	1	1	1	1	1	1	2	2	2	1	1	1	2
Minimum reproductive age	years	20	15	20	15	25	25	25	60	50	25	20	20	15	15
Minimum diameter growth increment	cm	0.008	0.009	0.007	0.015	0.008	0.012	0.012	0.001	0.007	0.016	0.012	0.012	0.016	0.016
Survival by duff depth—alpha coefficient	DIM	10.59	40.01	38.69	14.12	20.17	40.01	40.01	40.01	40.01	40.01	40.01	40.01	20.17	20.17
Survival by duff depth—beta coefficient	DIM	2.74	5.12	4.24	2.28	5.59	6.12	6.12	6.12	6.12	6.12	6.12	6.12	5.59	5.59
Bark thickness coefficient	DIM	0.063	0.046	0.063	0.028	0.063	0.015	0.022	0.03	0.05	0.06	0.035	0.05	0.014	0.021
Initial live crown ratio for mature trees	m/m	0.4	0.8	0.8	0.4	0.4	0.8	0.8	0.5	0.45	0.4	0.8	0.8	0.4	0.4
Establishment age	years	15	10	15	10	7	25	25	30	27	15	30	30	7	7
Establishment live crown ratio	m/m	0.5	0.8	0.6	0.5	0.4	0.8	0.6	0.4	0.4	0.4	0.8	0.8	0.4	0.4
Establishment height	m	1.4	1.5	1.4	1.4	1.8	1.5	1.5	1.5	1.4	1.8	1.5	1.5	1.8	1.8
Phenology parameters															
Spring leafout date	yearday	0	0	0	0	115	0	0	0	0	0	0	0	140	140
Fall leaf drop date	yearday	366	366	366	366	280	366	366	366	366	366	366	366	275	245
Time for leaf growth and drop	days	10	10	13	10	15	18	11	9	8	16	12	14	6	6
Latest tolerable spring frost	yearday	140	160	160	200	170	210	211	220	220	180	150	150	170	170
Earliest tolerable fall frost	yearday	230	230	210	200	210	220	220	230	220	220	260	260	210	210
Average snag life	years	20	20	30	40	40	20	30	90	90	40	20	20	20	20

¹ Lifeform: 0-evergreen, 1-deciduous, 2-shrub, 3-grass. ² Shade tolerance: 1-very shade intolerant, 2-shade intolerant, 3-moderately shade tolerant, 4-shade tolerant, 5-very shade tolerant.

³ Sprouting ability: 0-none, 1-low, 2-moderate, 3-prolific.